ELEMENTS

OF

LIFE INSURANCE.

For the use of Family Banks.

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BOSTON:
WRIGHT AND POTTER, PRINTERS,
No. 79 Milk Street.
1876.

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INTRODUCTION.

To Young America and his schoolmaster, this brief synopsis of the first principles of life insurance is respectfully dedicated.

The writer believes that to a great many young people, in assuming the responsibilities of a family, — a thing that ought to be earlier done than it generally is, — life insurance has been and may yet be as great a blessing as sound sleep. But it must be sound life insurance. And it will be all the sounder if the bargain between the insurer and the insured is fully understood on both sides, and embraces provisions for all the contingencies that may occur. A life worth insuring is generally a productive one, and by the same token will probably, within fifteen or twenty years, outlive the necessity of insurance. Hence the wisdom of providing in the policy for the tapering down of the insurance as the accumulation of property by the insured diminishes its necessity. This may be done to a certain extent by incorporating insurance and accumulation in the same policy.

It may also occur that a sudden and unexpected change of circumstances may make the continuance of a policy inconvenient or impossible.

For these reasons the terms of egress alive should be as carefully stipulated as of egress by death. The common neglect of any stipulation in regard to egress before death or the close of the term, has almost as bad an effect on the trustees of life insurance companies as if they left out of their daily prayer the petition "Lead us not into tempta-

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tion." It leads to dubious and not easily convertible investments. The fact that trust money *may* be called for in a short time, at the will of a living truster, is the best security for the faithful discharge of the trust.

It is perhaps because the people, in taking and maintaining policies on their lives, have incautiously made trusts to the extent of hundreds of millions, which they cannot revoke any faster than they die, or till some very distant date fixed, that life insurance has fallen into disrepute. A careful study of the arithmetic of the business, to which this paper will serve as an entering wedge, will enable any one to judge whether this is a necessity or not.

One thing cannot fail to be demonstrated, that whenever there is any self-insurance under a policy, it should be kept always and carefully distinct in the accounts from the insurance.

ELIZUR WRIGHT.

Boston, Jan. 24, 1876.

ELEMENTS OF LIFE INSURANCE.

DEFINITIONS.

Insurance is a contract or covenant, for a consideration, to pay a certain sum of money as an indemnity for a loss that will ensue from the occurrence of some future event, which, so far as human foresight is concerned, may or may not occur.

Insurable Interest. A party exposed to suffer a *pecuniary* loss by such an occurrence, whether it results in the destruction of life or property, and no other, is said to have an *insurable interest* in the life or property.

The sum insured by a policy, or contract, always includes what the insurer is exposed, under the policy, to lose by the occurrence of the event insured against, together with the consideration, or what the other party to the contract is exposed to lose by its non-occurrence. The former would properly be called *risk* and the latter *premium*—the transaction being analogous to a bet—but the term, *risk*, is usually understood to include both, and to be equivalent to *sum insured.* But the *sum insured* is by no means always the same as the *face of the policy*, for reasons that will presently appear.

Self-Insurance. If we take the face of the policy, or sum *said* therein to be insured, as the sum insured, then it becomes important to remark, that, in life insurance as commonly practiced, only a part of the insurance under the policy is done by the insurer, or party of the first part; the remainder, consequently, must be done by the insured, or party of the second part, and is therefore properly called *self-insurance.*

PREMIUM AND DEPOSIT. Whenever the face of the policy includes both insurance and self-insurance, what is usually called the *premium* is partly a mere *deposit* in trust, going to increase a fund in the hands of the insurer, which has no other effect than to diminish the insurance done by him. This fact, which is almost peculiar to life insurance, results from its being based on tables of mortality and the *commutation*, to be presently explained, of the natural annual premiums thence resulting.

A TABLE OF MORTALITY consists of a series of hypotheses, or assumptions, in regard to the probability of dying *within one year*, at any specified age. It usually expresses this probability for every age from infancy up to an age beyond which, at any insurable age, the probability of living is next to none, and far beyond any age where an insurable interest in the life can be expected to exist naturally. The table also, by always giving, as the number alive to commence any year of age, the number alive at the beginning of the previous year *less* the number that were assumed to die in that year, enables us the more conveniently to express the probability, at any age, of living through or dying within any *term of years.*

All life insurance with which the interest of money has anything to do, is necessarily ANNUAL. As the probability of dying within one year is not exactly the same at any two ages, on the tabular hypotheses, and as interest is compounded annually, it becomes necessary in all calculations in regard to policies extending over a term of years, to treat the annual risks *separately.* And for this reason it is *impossible* to avoid self-insurance, or to make the sum insured by the company, or bank, and the face of the policy identical, except by having the insured pay each year *only* the premium due to the probability of dying in that year. Such a premium may be distinguished as the *natural* premium, and is always annual during the term, or till the life terminates within it.

SINGLE PREMIUM. When the contract or policy covers a term of years, either the whole or a limited part of life, and the whole premium due to the probability of dying within that term is paid in advance, it is called SINGLE PREMIUM, and in that case, the self-insurance is at its *maximum*, and the insurance at its *minimum*.

APPLICATION OF TABLES OF MORTALITY.

In any table of mortality the assumption at each age is, that out of a certain number of persons, all of that age and of fair average vitality, commencing a year, a certain number, neither more nor less, will die in it. This of course holds true only as a matter of average on a large number of persons or years taken into account. But the number of persons taken into account need not all be of the same age, if only there is a sufficient number, and each is treated according to age. If the number of the insured is not sufficient for safety, there must be capital to meet the excesses of loss, so as to combine a sufficient number of years of insurance to secure a safe average.

To explain the use of a table of mortality, as regards any kind of policy on a single life, it is only necessary to consider three consecutive ages in it. The following are three ages from the two different tables in common use in this country, the first being adopted by law in Massachusetts, and the second in the State of New York.

FROM THE ACTUARIES', OR ENGLISH "COMBINED EXPERIENCE" TABLE.

Age, 40	Living, 78653	Dying, 815
" 41	" 77838	" 826
" 42	" 77012	" 839

FROM THE "AMERICAN EXPERIENCE" TABLE.

Age, 40	Living, 78106	Dying, 765
" 41	" 77341	" 774
" 42	" 76567	" 785

The only significance of these numbers lies in the ratios which they bear to each other, at the same or different ages. For example, the ratio or fraction $\frac{815}{78653}$ expresses the probability, or chance, of a person aged 40 dying within a year, while $\frac{77838}{78653}$ expresses the probability of his living through the year, and $\frac{77012}{78653}$ that of his living through two years. To determine the cost in our decimal currency of insuring a unit for one year, it is convenient to convert the vulgar fraction into a decimal. $\frac{815}{78653} = .010362$. This shows that to insure a dollar for one year, at 40, costs a little over one cent, or to insure $1000, $10.36 and 2 mills. It also shows that out of exactly 1000 persons commencing a year at 40, we may expect 10 or 11 to die within a year, and a little more likely 10, than 11.

By the American Table at 40, since $\frac{765}{78106} = .009794$, it costs a little less than one cent to insure one dollar one year; or, out of exactly 1000 persons we may expect 9 or 10 to die within one year, and a little more likely 10 than 9.

When we speak of $10.36 being the net cost of insuring $1000 one year, at 40, by one table, and $9.79 by the other, it is on the supposition that the claim, if it occurs, is settled at the end of the year, and the premium at the same time. But premium is usually paid in advance, so that the above premiums are discounted a year, to $9.96 and $9.42 at 4 per cent, and these at that interest are the net annual or natural premiums or costs for $1000, by the respective tables, the latter being about 5.42 per cent lower than the former. It does not follow, when surplus, if any arises, is returned annually, that insurance by the latter is any cheaper than by the former. It may not be quite so safe ; for suppose exactly 1000 persons to be insured for $1,000 each, there would in one case be at the end of a year $10,362, and in the other $9,794 ; but by both tables there are more likely to be 10 deaths than any other number, and of course, $10,000 to pay, which would show a surplus of $362 for the Actuaries' Table, and a deficiency of $206 for the American. The best security is attained by assuming a rate of mortality a little higher than what is to be expected, and a rate of interest a little lower.

KINDS OF POLICY.

There are just two kinds of policy in common use.

1. Term Insurance, by which nothing comes to the estate or heirs of the insured if he outlives the term.

2. Endowment Insurance, by which if the insured outlives the term he receives the face of the policy the same as his heirs would have done had he died within the term.

A *whole life* policy, that is, a policy payable only at death whenever that event may occur, is one or the other, or both. As a contract it is a *term* policy with an indefinite term, which may possibly stretch to the age of Parr or Methuselah. As a matter of calculation, under the tabular assumptions, it is an endowment insurance payable to the party himself, if he survives the ultimate age of the table, as well as to his heirs on his previous death.

Either of the two kinds of policy may be paid in various ways.

1. PAYMENT BY THE NATURAL ANNUAL PREMIUMS.

The *net* natural annual premium per $1000 by the two tables, for the two kinds of policy on the two legalized assumptions of interest are,—

MASSACHUSETTS 4 PER CENT.

	ACTUARIES'.			AMERICAN EX.	
	Term.	End. Ins.		Term.	End. Ins.
Age, 40	$9.96	$9.96	Age, 40	$9.42	$9.42
" 41	10.20	10.20	" 41	9.62	9.62
" 42	10.48	961.54	" 42	9.86	961.54

NEW YORK 4½ PER CENT.

	ACTUARIES'.			AMERICAN EX.	
	Term.	End. Ins.		Term.	End. Ins.
Age, 40	$9.92	$9.92	Age, 40	$9.37	$9.37
" 41	10.16	10.16	" 41	9.58	9.58
" 42	10.42	956.94	" 42	9.81	956.94

It will be observed here that the *natural* annual premiums for both term and endowment policies are alike, except for the last year of the term. Then, in case of the endowment insurance, as the claim must be paid at the end of the year whether the insured be dead or alive, the advance cost, or premium must be simply $1000, discounted for one year at the assumed rate of interest.

The same will be true of a *term* policy, if the term is extended so as to include the last age in the table, for at that age, according to the hypothesis, death is certain to occur within one year. Hence according to the tabular hypotheses such a term policy, an endowment insurance policy for the same term, and an ordinary whole life policy are identical. The series of natural premiums in the three cases would be exactly the same. In point of fact, however, if the life should, as it might, exceed the ultimate age of the table, the results would be different. The holder of the term policy would be left with nothing. The holder of the ordinary life policy would have to keep on paying the premium of the last year till he should die, or get nothing then. The holder of the endowment insurance would get the face of his policy.

2. PAYMENT BY COMMUTED PREMIUMS.

The natural premiums may be commuted, 1. Into a single premium. 2. Into a limited number of equal, level, or constant annual premiums; 3. Into a limited number of increasing or decreasing annual premiums, or 4, and this is the most common case, into an equal, level, or constant series of annual premiums for the whole term. The commuted premiums are said to be *equivalent* to the natural premiums, and so in a certain sense they are. Under the hypotheses of the table, the commuted and the natural are alike safe to the company and fair to the insured. But they differ vastly in regard to the risk the company engages to carry under them, and the various methods of commutation above stated produce remarkably different effects upon such risk, about which the insured commonly knows too little.

It will be sufficient for the present purpose to explain the method of the commutations into single premiums and into level annual premiums for the whole term, and their several effects on the risk or insurance.

METHOD OF COMMUTATION.

1. The commutation of the net natural premiums of a term policy of $1000 for three years, at age 40, by combined experience at 4 per cent.

First let us find the present value of a dollar payable each year in advance, if the party should be alive to pay it. The payment of the first being certain is set down at its full value. (See column A below.) If the second were *certain* its present value would be 0.961538, but as the tabular chance of the party being alive to pay it is $\frac{77838}{78653}$ its present value is decreased to $\frac{77838}{78653} \times .961538 = .95157$ about. Again, the present value of a dollar to be paid *certainly* at the end of two years is .924556, and the tabular chance of the party being alive to pay it is $\frac{77012}{78653}$, hence the present value of the contingent payment is $\frac{77012}{78653} \times .924556 = .905266$. Let us place these present values of the one certain and two contingent payments of a dollar in a table, column A, and the natural premiums in column B.

Age.	A		B		C
40	\$1.000000	×	\$9.9634	=	\$9.9634
41	.951575	×	10.2036	=	9.7095
42	.905266	×	10.4754	=	9.4830
	\$2.856841				\$29.1559

This done, obviously, if we multiply the natural premium that will be due each year, provided the party is then alive to pay it, by the present value of a dollar due at the same time under the same contingency, we should have the results in column C, and these will be the present values of the three natural annual premiums respectively. Of course their sum will be the commuted *single premium*, the present value of any payment being, under the hypotheses, equivalent to the payment itself. To commute this single premium of \$29.1559 into a level annual premium we have the proportion, as the present value of a dollar payable annually in advance for three years under the tabular contingency is to one dollar, so is the present value of all the payments under the same contingency to the dollars to be paid annually, that is.—

As $2.856841 is to $1, so is $29.1559 to $10.2056, which last is the commuted net *annual premium.*

EFFECT ON RISK.

Now, before going any further, let us see whether the payment of these commuted premiums instead of the natural ones will have any effect on the quantity of insurance which the company will do, supposing in both cases that the party lives through the term. The reader, to understand what is meant by quantity of insurance will please to refer to the definition of *sum insured* above given. In case the natural premiums are paid, it is plain by the definition that the company will insure $1000 annually, and will be paid for it $30.6424. That is, the quantity of insurance purchased in three years is $3000 and the advance cost yearly, as it goes, aggregates $30.64, and the company's risk under this form of payment is a *maximum.*

Let us now see what the company will insure in case the two commuted premiums are paid.

The amounts of the two premiums at the end of the first year, when the loss, if it occurs, is supposed to be payable, are as follows,

	Single Prem.	Ann. Prem.
Premiums, ...	$29.1559	$10.2056
Add interest, ...	1.1662	.4082
	$30.3221	$10.6138
Subtracting the amounts from the face of the policy, we find what in each case the company is exposed to lose by the death, .	$969.6779	$989.3862

But it does not follow that because the company is exposed to lose these sums in case of the death, that the insured loses the whole, either of the $30.32 or of the $10.61, in case he does *not* die. To find what he is not exposed to lose we have the proportion, as what the company is exposed to lose when the natural premium only is paid, is to the $1000 which it then insures, so is what it is exposed to lose in any other case to what it then insures. That is, at the age 40, as 989.64 : 1000 :: 969.68 : 979.83. This $979.83 being all that the company insures the first year in case of the payment of single premium, the balance of the $1000 or 20.17 must be insured, if it is insured at all, by somebody else. To distinguish it from what the company or bank insures, it is called SELF-INSURANCE. Both by statute law and the necessity of the case, it must be on hand or in "reserve," if the party does not die. Subtracting this $20.17 from the $30.32, we have $10.15, which the insured was exposed to lose, and did lose by *not* dying. And it was by the company's *gaining* this and other small sums in the same way, that it was able to pay, and did probably, its loss of $969.68 on some other party. This and what the company was exposed to lose by his dying, 10.15 + 969.68, make what it insured, $979.83 (see definition), the first year. The second year, if the party lives to be insured the company has

On hand at the start of Single Premium, . .	$20.17
Add interest, ...	.81
	$20.98

Hence it is exposed to lose by the death occurring in the second year, $979.02. Hence, as 989.39 is to 1000, so is 979.02 to 989.52 which the company insures the second year. The balance, or $10.48, is the self-insurance. This is exactly the natural premium for $1000 at the age of 42, so that in the third year, as in the last year of any term policy, the company insures the whole $1000, or face of the policy. The effect then of paying by single premium in this case is to reduce the insurance by the company to

First year, ...	$979.83
Second year, ...	989.52
Third year, ...	1000.00
Aggregate, ...	$2969.35
Thus transferring of the risk to the party himself,	30.65
	$3000.00

By the same process the effect on the risk by the commuted annual premium might have been calculated. But in so short a term it is exceedingly slight, the self-insurance being only 26 cents in this case the first year, and 28 cents the second, so that

The company insures in these three years, . .	$2999.46
And the party himself, ...	.54
	$3000.00

METHOD AND EFFECT OF COMMUTING IN ENDOWMENT INSURANCE.

But when the natural premiums of the endowment insurance policy are commuted, no matter how long the term, nor whether on the longest we use the commuted annual, or single premium, the effect is all important, and cannot be ignored or neglected without involving the policy-holders in mystery, if not the company itself in chaos. Of course the effect is most conspicuous on the short term here selected.

Method. On the same assumptions as before, we construct the table of present values of a dollar, natural premiums, and present values of such natural premiums.

Age.	A		B		C
40	$1.000000	×	$9.9634	=	$9.9634
41	.951575	×	10.2036	=	9.7095
42	.905266	×	961.5385	=	870.4480
	$2.856841				$890.1209

Hence the commuted single premium of the three years' endowment insurance policy for $1000, at 40, is $890.12; and the annual premium is $\frac{890.1209}{2.856841} =$ $311.58, very nearly.

All other commutations are calculated by the same process extended to all the years of the term.

EFFECT. —

	Single.	Annual.
Suppose these premiums paid, .	$890.12	$311.58
Add interest, ...	35.60	12.46
Cash to meet claim, . . .	$925.72	$324.04
Company's exposure to loss, . .	74.28	675.96
Applying as before the ratio $\frac{1000}{989.64}$ we find insurance by company,	$75.06	$683.04
Self-insurance, ...	$924.94	$316.96
For second year add premium, .	0.00	311.58
	$924.94	$628.54
Add interest, ...	37.00	25.14
	$961.94	$653.68
Company's exposure to loss, . .	38.06	346.32
Applying the ratio $\frac{1000}{989.39}$, we find the company insures the second year, ...	$38.47	$350.03
Self-insurance, ...	961.53	649.97
For third year add premium, . .	0.00	311.58
	$961.53	$961.55

Hence we see there is, in neither case, any insurance done by the company in the third year, for in both cases we have on hand, in the self-insurance fund, a sum sufficient to meet the claim; that is, the natural premium of the last year, on the hypothesis that death was certain in that year. Under the natural premiums, the company insured, as in the case of the term policy, $1000 in each of the first two years, and nothing in the third, because the hypothesis precluded uncertainty. Therefore, the effect of the commutation was to reduce the aggregate quantity of insurance which would have been done under the natural premiums, viz.: $2000, to insurance in the

	Single Prem.	Annual.
First year,	$75.06	$683.04
Second,	38.47	350.03
Total,	$113.53	$1033.07
Self-insurance, first year,	$924.94	$316.96
" second year,	961.53	649.97
" third year,	1000.00	1000.00
Total,	$2886.47	$1966.93
Aggregate of insurance and self-insurance in three years,	$3000.00	$3000.00

It is very true that this policy is capable of being considered as a combination of a term insurance with a pure endowment policy, the former having for its commuted net annual premium, $10.20, as we have already seen, and the latter, $301.38. But this partially hedging one hypothetical series of bets by an opposite hypothetical series, is a purely algebraical conception, more curious than useful; a wholly unnecessary refinement. The simple truth is, that the actual contingency is confined to the diminishing series of insurances by the company. What has above been called *self-insurance* for convenience, is so only by a figure of speech. Literally it is nothing but an accumulation of the policy-holder's money, over and above what he pays for insurance, which by its increasing amount, effects a corresponding diminution of the insurance under the policy.

LIFE INSURANCE ALWAYS ANNUAL.

As life insurance, except when interest is assumed at *zero*, can never be done in the lump, but life must be divided into years, or portions, corresponding to the rests at which the interest is compounded, the business is greatly simplified by avoiding all payments except those which are annual for the term. For example, the payment of $890.12 as the single premium for an endowment insurance of $1000, for three years, is exactly equivalent to placing that premium in deposit, at 4 per cent., in a bank, and taking an annual premium endowment insurance for the same term, of $109.88, the difference between the single premium and $1000. For the yearly interest of $890.12, will be $35.60, which discounted a year is $34.23, precisely the annual premium for a policy of $109.88. We have seen that the insurance done under such a policy, for $1000, in three years was $1033.07; hence the insurance under that of $109.88 will be $\frac{1033.07 \times 109.88}{1000} = 113.53$, which is the same as it was under the single premium policy.

Reducing all policies to one pattern as to terms of payment, which may easily be done by clothing a company with proper banking or trust powers, it becomes easy to pre-calculate all the values and quantities concerned in every year of the term, and thus completely distinguish the insurance from the self-insurance, and make the footings of the books reveal everything that is desirable to be known. For example, in regard to the annual premium endowment insurance policy for $1000, above cited, we have found the insurance and self-insurance for each year to be as follows:

	Ins.	Self Ins.
40	$683.04	$316.96
41	350.03	649.97
42	0.00	1000.00

As the advance normal or tabular cost of insuring $1000, at 40, is $9.9634, we have $\frac{9.9634 \times 683.04}{1000}$ $= 6.81$, the advance normal cost of insuring $683.04 one year; and in the same way we have $\frac{10.2036 \times 350.03}{1000}$ $= 3.57$, the normal cost of insuring $350.03 one year. Subtracting the normal cost of the insurance, from the net annual premium for each year, we have the deposit for the year, in the self-insurance or accumulating fund.

INSURANCE VALUE.

The next most important thing to be known, is the present value of the series of "normal costs," and especially if it is a long one. This is found, just as previously we found the present value of the series of natural premiums. They are, in fact, the net natural premiums of the sums successively insured by the company, and their present value is the *single premium*, in a sense equivalent to them, for all such insurance. But, of course, such single premium cannot be actually substituted for the natural ones, without reducing the insurance to be done by the company, just as in the former case. Yet this single premium, or prospective value of the normal costs, has an important use, as will presently appear. It may conveniently be called the "INSURANCE VALUE" of the policy, to distinguish it from self-insurance or reserve value. The latter is an accumulation from past payments. The former is the one normal cost immediately due, or just paid, together with the present value of all the future ones. It is the measure of the insurance contracted to be done by the company under the policy. Consequently, if any charge is made for canceling the policy, so far as that charge is designed to compensate the company for loss of insurance business, it must be based, wholly and strictly, on the *insurance value.* In regard to the surrender of the self-insurance fund which may exist at the same time, no charge having any relation to that can be proper which would not be proper in withdrawing deposits from a savings bank. In other words, no rule for the surrender of policies can be equitable, which does not regard the insurance and self-insurance values distinctly.

MARGIN OR "LOADING."

In addition to the net premiums, as above explained, there is always a margin, more or less arbitrary, charged each year, to provide for expenses and extraordinary death claims. The mode of determining this, need not now be explained. Assuming an annual margin of $4, casting the insurance values, and assuming eight per cent. of such values as a proper surrender charge, to be deducted from the self-insurance fund or reserve, on withdrawal, the following table, like a map, will show the whole course of our three year endowment insurance policy, for $1000.

Age of Entry, 40. Gross Premium, $315.58. Net Premium, $311.58.

Age.	Insurance.					Self-Insurance.		
	Margin.	Normal Costs of Insurance.	Company's Risks.	Insurance Values.	Surrender Charges.	Deposits.	Reserve.	Surrender Values.
40	$4.00	$6.81	$683.04	$10.21	$ –	$ –	$ –	$ –
41	4.00	3.57	350.03	3.57	0.29	308.01	316.96	316.67
42	4.00	0.00	0.00	0.00	0.00	311.58	649.97	649.97
43	–	–	–	–	–	–	1000.00	1000.00

So short an endowment insurance is perhaps never offered or taken. But it as fully illustrates as a larger one all the processes of calculation, and will show the absurdity of some of the usual rules and practices still better. For example, in fixing a margin, it is usual to add 25 or 30 per cent. of itself to the net premium to make the gross premium. Seldom less than 20 per cent. This would give in the case above, a margin of over $60 instead of $4. Again, commissions are paid and expenses assessed by a percentage on the gross premium, in entire disregard of the proportion of deposit to normal cost of insurance contained in it. By the usual commission applied to this policy the agent would get many times the whole cost of the insurance, and the policy-holder would pay annually for his share of the expenses at least ten times that cost. Of course these absurdities grow less enormous as the term of the policy is lengthened, and the insurance bears a higher ratio to the self-insurance under the policy. But they still exist, and must upset the equity, more or less, till the insurance and self-insurance are rigidly distinguished for every year of every policy, and each is treated on principles appropriate to itself.

This will be seen by the example of a fifteen-year endowment insurance for $1000, entered at the same age and analyzed in the same way.

Age of Entry, 40. Gross Premium, $59.21. Net Premium, $54.77.

	Insurance.					Self-Insurance.			
Age of Person.	Margin.	Normal Costs of Insurance.	Company's Risks.	Insurance Values.	Surrender Charges.	Deposits.	Reserve.	Surrender Values.	Age of Policy.
40	$4.44	$9.49	$952.91	$73.97	–	$45.28	–	–	0
41	4.44	9.22	903.65	67.75	$5.42	45.55	$47.09	$41.67	1
42	4.44	8.93	852.12	61.54	4 92	45.84	96.35	91.43	2
43	4.44	8.64	798.22	55.31	4.42	46.13	147.88	143.46	3
44	4.44	8.34	741.90	49.10	3.93	46.43	201.78	197.85	4
45	4.44	8.02	682.93	42.88	3.43	46.75	258.10	254 67	5
46	4.44	7.67	621.26	36.70	2.94	47.10	317.07	314.13	6
47	4.44	7.23	556.68	30.58	2.45	47.54	378.74	376.29	7
48	4.44	6 70	488.96	24.61	1.97	48.07	443.32	441.35	8
49	4.44	6.05	417.79	18.90	1.51	48.72	511.04	509.53	9
50	4.44	5.26	343.06	13.57	1.09	49.51	582.21	581.12	10
51	4.44	4.29	264.34	8.78	.70	50.48	656.94	656.24	11
52	4.44	3.13	181.16	4.74	.38	51.64	735.66	735.28	12
53	4.44	1.71	93.23	1.71	.14	53.06	818.84	818.70	13
54	4.44	.00	.00	.00	.00	54.77	906.77	906.77	14
55	–	–	–	–	–	–	1000.00	1000.00	15

In this table the margin, or difference between the gross and net premium, is determined by providing for an expense of two-and-a-half per cent. for the collection of the premium, and four per cent. on the initial insurance value of the policy. As this will be during the term, more than two-thirds of the entire normal costs of the insurance to be done under the policy, it would seem to be much more than ample provision for reasonable expenses, and a considerable provision against extraordinary mortality. Yet the gross premium ordinarily charged for this policy, in a mutual company, is $68.46, having a margin of $13.69, so that if the policy-holder should live through the term, he will have paid as a provision for expenses, more than twice the tabular price of the insurance he has enjoyed. This would be of little consequence, if the excess came back to him yearly in the dividends of surplus; but that is prevented by the practice of assessing the expenses on the premium, the greater part of which is self-insurance deposit, to say nothing of its being overloaded in this case.

TRUE ASSESSMENT OF EXPENSES.

If this table represents the facts, as they must, on the average exist in each year of the policy, it is plain that the premium paid is never the measure of the proper share of the expenses. In the first place, in regard to the self-insurance fund, each policy-holder should pay towards the expenses, in each year, in proportion to the amount he has in it that year, and not more than he would in an ordinary savings bank, or some fraction of one per cent. After this is deducted from his accumulation at the end of each year, if the amount, as it ought to, exceeds the stipulated four per cent. reserve, the excess, in a "family bank," will return to him in the settlement of his next premium, for the stock, or guarantee capital, can make no profit out of the self-insurance. It is plain that in regard to the self-insurance business, under the policy, the expense will increase every year with the accumulation, but will not amount to $10 on the $1000.

The balance of the expenses are strictly the insurance expenses provided for by the margins. They may be divided into two classes. Those which are incurred to enlarge the membership, and those which belong to the conduct of the business as it is. The former, the policy-holders, are interested to bear in the ratio of the insurance value of their policies at the time. The latter, in proportion to the value of the risk the company has borne for them that year, that is, to the normal cost of the insurance that year. With the policies properly analyzed, and the bank's books properly kept, these ratios are as readily ascertained as the premiums themselves. Plainly, the insurance expense for any policy ought not to equal the margin even the first year, and as plainly it should grow less every year, till it is nothing in the last. Hence, unless there should be an extraordinary mortality to call upon this resource, more and more of the margin will return every year to the policy-holder, to diminish his premium. The capital stock can make no profit beyond that of its own investment, except where the actual cost of the insurance is less than the normal. In any year where the actual cost of the insurance (not including the self-insurance in the claims), with the insurance expenses, exceeds the normal costs and margins, the capital must make good the difference. It is plain that the stockholders will have a strong motive, both of desire and fear, to be economical in expenses and careful in the selection of risks. As many of the stockholders will also be policy-holders, a stock family bank, under the restrictions above mentioned, ought to prove the most really mutual of all mutual companies.

THE BETTING ELEMENT.

Life Insurance, like any other insurance, always involves a bet, or series of bets. As betting, it has been in some countries wholly prohibited. In English law it is only permitted when there is an insurable interest to justify it. And, plainly, it ought to be in the power of the insurer to cancel the policy on returning the self-insurance fund, when insurable interest can be proved to have ceased. There should be no unnecessary gambling, either on the continuance of the life or the persistence of the policy. Self-insurance always restricts the bet, and how it restricts it will be seen if we observe how a death claim would be settled, say in the 14th year of the foregoing policy. In this year the policy-holder virtually won his bet that he would die, and the bank lost its bet that he would not. The following settlement shows what the bet was, and how the whole claim was paid:

1. By Insurance,	Stake of winner ($1.71, with interest), returned, . .	$1.78
	Stake of Company, . . .	91.45
		$93.23
2. By Self-insurance, ...		906.77
		$1000.00

SURRENDER CHARGE AND SURRENDER VALUE.

If the bank were to issue a policy for a term of years, payable by the natural annual premiums, leaving nothing on hand at the end of any policy-year, it would incur the risk of having the soundest lives drop off during the term, leaving the less sound still insured. This might prove fatal to its solvency. To prevent this, it must either exact a deposit to be forfeited in case of the discontinuance of the premiums, or it must work on commuted premiums, and exact in case of discontinuance a forfeiture of the whole or part of the reserve thence resulting. The latter course has usually been adopted in life insurance. But it is objectionable in all cases, and intolerable in endowment insurance of definite terms. The injury to the company by the withdrawal of a good life prematurely, has little, if any, relation to the reserve. It is proportional to the insurance value, or present value of the insurance remaining to be done under the policy. It may be stated, from careful observation of the experience of the past, that if retiring policy-holders pay a surrender charge equal to eight per cent. of the insurance value of their policies, the company, being relieved from the risk of further insurance, will be as strong without them as with them, if not stronger. On very long policies, where the insurance value is large, and the reserve at first small, this charge may for a year or two exceed the reserve, and in that case there would be no surrender value. Indeed, if such policies were issued, there would be need of a special deposit, to secure the payment of the surrender charge, of the difference between the charge and reserve. But in all short term endowments the reserve at the start exceeds the charge, and in all long ones it does so after a year or two. As the proper and equitable surrender charge, whatever percentage of the insurance value it may be, always decreases, while the reserve increases, it is manifest that a charge which is any fixed fraction of the reserve must be inequitable, that it must be insufficient on life policies or long endowments at the start, and become more and more exorbitant afterwards. The common rule gives a correct result only by accident, at the point where it intersects the proper line of charge. It will be noticed in the foregoing table that the surrender value at the end of any policy year is the reserve less the surrender charge. The common rule of making the surrender charge a percentage of the reserve itself, say 20 per cent., tends to the absurdity of exacting for the surrender of the policy above given, at the end of its 14th year, after the insurance under it has wholly ceased, $181.35. This is the penalty for not depositing with the company, as a Savings Bank, $59.21, to secure the payment of $1000 at the end of the 15th year. A principle which leads to such a result cannot be considered sound any where.

PREMIUM NOTES.

A curious practice of taking a part of the premium in the policy-holder's note was commenced by the Mutual Benefit Life Insurance Company of New Jersey, in 1845, which has presumably led to the contemplated reform in life insurance, if reform it be. At first, the company took three-fourths of the usual commuted annual premium in a note, subject to assessment when required. But when it was shown that with so large a proportion of note, assessment would be required, and would doubtless result in more or less loss to the company, the note was restricted to half the premium. Any surplus at the end of the year was to go to diminish the note, if the party continued and survived a certain period. In the meantime, if a claim occurred, the note in the hands of the company was good against it for its full amount. But the remarkable point of interest is, that if the party discontinued his premiums, or let his policy *lapse*, as the phrase is, *the note was never collected.* It was just the same as *cash* to the company, and, indeed, when it did not exceed the reserve or self-insurance, was the safest possible investment; hence, being regarded as null and void when the policy lapsed, it was exactly the same as so much *cash surrender value.* It will be obvious, on an inspection of the foregoing table, that a fifty per cent. note given annually would fall always within the surrender value there calculated, so that its surrender in case of lapse could not endanger the solvency of the company, if an eight per cent. charge on insurance value is sufficient to maintain solvency. It is true that on a whole life or long endowment policy such a note might slightly exceed the reserve, and very largely the surrender value, as here calculated, for the first two or three years; but the effect of surplus was such in diminishing the notes as to bring them nearly always within the self-insurance, and, on the whole, within the surrender value as above calculated. A majority of the life insurance done in this country has been done on the premium note system, and no company has failed on that account. Hence, it is too late in the day to deny the duly qualified right in the reserve of the policy-holder, who pays the commuted premium in cash, or to object to a cash surrender value being precisely stipulated. The premium note, to the extent the company can conservatively take it, has simply the effect of dispensing with accumulation on the part of the policy-holder, and limiting the business done under the policy to the decreasing series of pure insurances. As to the self-insurance part of the contract, after providing in cash for the surrender charge, both principal and interest might be paid in note, and that part of the transaction would sink into a book-keeping fiction, with a length precisely equal to its breadth. The trouble with premium notes has been, that the policy-holder has been made to believe that the surplus or dividends would finally, wholly, or very nearly, extinguish them, instead of leaving them largely to extinguish the death claim or endowment.

THE MASSACHUSETTS NON-FORFEITURE LAW.

The Act of 1861, to regulate the forfeiture of life insurance policies, grew out of the fact that a policy-holder who had paid his premiums partly in notes, received a surrender value in case of discontinuance equal to his outstanding notes ; whereas, if he had paid the same premiums in cash, he received none. The Act was a crude attempt to establish something like equity between the two, by obliging the company to give additional insurance to the value of four-fifths of the cash part of the reserve, after throwing out the note part, if any existed. The mistake was in adopting the companies' false basis of surrender charge, the reserve itself, and deducting one fifth — too small in case of early lapse, and vastly too large when the reserve has become a considerable part of the face of the policy. If the constituents of the existing companies wish this law preserved on the statute book, they have an unquestionable right to be gratified. But that is no reason why other corporations should not be allowed to stipulate cash surrender values on fair terms, and be exempted from the law of 1861, when they do so.

FAMILY BANK.

The family, the domestic trinity, or tri-unity of mother, father and child, is what society, civilization and all religion worth the name, grow out of. Whatever corrupts it, corrupts all. Whatever tends to promote industry, self denial for others, thrift, independence, and the early development out of pure materials of the said trinity, under the most favorable conditions for the continuance of purity, peace and happiness, must be worthy of all encouragement.

The blackest cloud ont he prospects of Christendom, at this moment, and it has always been the blackest cloud to every civilization, is the crowding into great cities of the poor, under circumstances that almost preclude the possibility of purity and happiness. No gospel that has ever yet been preached has secured average saintship for the city poor, housed in hired cellars or garrets. In the present state of steam power and machinery, and swift travel, there seems no good reason why every family engaged in city or town industry should not have a home of its own, with pure air, garden, flowers, birds' nests. The great discoveries and inventions of the last hundred years have resulted in an almost infinite production of wealth; but if we do not use them to abolish poverty — the absolute, not the comparative — they may prove at last, a curse instead of a blessing. The rich are likely to see their "cloud-capped towers and gorgeous palaces pass away like the baseless fabric of a vision," unless they see that the brick-makers, stone-cutters and hod-carriers, the spinners and the weavers, have clean and wholesome homes.

The institution which has tended most to bless the family, is perhaps the savings bank. The "family bank" aims: first, to be a savings bank, with the best security for faithful management; second, to furnish life insurance on the best possible terms, where it is most needed; third, to accommodate with loans, so far as it can be done safely, the poorest borrowers in preference to the more wealthy.

By its life insurance function the Family Bank will prove a benefactor to every ordinary savings bank, removing the chief objection to small loans to men with small means besides their labor. If such a man has his life insured under a policy like that before explained, and has borrowed of any savings bank $1000, by depositing $120 a year, or less than $3 a week in the Family Bank, he may pay the interest on his loan, and at the same time maintain a policy which would wipe off his debt at once if he should die, and do the same at the end of its term if he should live through. And, in the meanwhile, he would be living in and improving a home of his own, instead of existing in one which would cost him the same $120 a year, or more, for rent, which would grow more squalid all the while, and of which at the end of fifteen years he would not own a sliver, if haply there should be one left.

A SOLID BASIS.

The great difficulty in the way of founding a Family Bank at the present time, is the uncertain relation of the paper currency to gold, the most, if not the only tolerably stable standard of value. An institution whose contracts may extend even to sixty years, must take the best possible care that it does not have to pay out either more or less valuable money than it receives. This it cannot do if it makes its contracts and keeps its accounts in a currency whose value, compared with the best known standard, may vary from its present one-eighth up to par or eight-eighths down to zero. There seems no way to avoid this difficulty in the absence of any near prospect of resumption, but to take advantage of the authority of the United States Supreme Court, and make all contracts and keep all accounts on a gold basis. In a hand-to-mouth business it would be folly to incur this inconvenience; but those who would make sure provision for the remote future, must either do it or drift into the general bankruptcy whither this chronic repudiation by our government is sure at last to carry all but those who have the miserable skill to enrich themselves out of the common ruin. There is nothing stable in this world but truth. The trouble with the theory that

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paper money is stable, while it is the value of gold that fluctuates, is, that it is no more true than that the ocean has no tides, but the land rises and falls. Even infancy knows better. An inflationist once said to a lisping little boy, " Sonny, your little dog has got five legs, calling his tail a leg." " No, Thir," was the prompt reply, " calling hith tail a leg duthn't make it a leg." Promises that are perpetually broken are not performances, nor equal to them.